MILITARY MEDICINE, 167, 10:853, 2002

Psychological Screening Program Overview

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This article reviews the literature on health surveillance conducted during military deployments, focusing on models for assessing the impact of operational deployments on peacekeepers. A discussion of the stressors and potential mental health consequences of peacekeeping operations follows with relevant examples of findings from U.S. and international military forces. Psychological screening in different peacekeeping operations conducted in U.S. Army-Europe is reviewed. The review begins with the redeployment screening of military personnel deployed to Bosnia mandated under the Joint Medical Surveillance Program, and continues through the present screening of units deployed to Kosovo. The detailed description of the screening program includes a discussion of procedures and measures and demonstrates the evolution of the program. A summary of key findings from the screening program and a discussion of future research directions are provided.

Introduction

Commanders consider the health and fitness of their soldiers critical indicators of the operational readiness of their units. Commanders know that unhealthy and unfit personnel will compromise the ability of their unit to accomplish its mission, whether it is in peacetime (e.g., humanitarian or peacekeeping missions) or wartime (e.g., peace enforcement or combat missions). The medical readiness of military units is likely to be compromised during military deployments, especially when the stressors of the mission are high or when the deployments are in regions with an inadequate or undeveloped infrastructure. One way to maximize the medical readiness of military personnel is through medical surveillance, the systematic collection of data for "characterizing and countering medical threats to a population's health, well-being, and performance."[1-3]

Mental Health Consequences of Peacekeeping Operations

The role of the military in peacekeeping missions typically has been to oversee established peace accords while maintaining a strictly neutral presence. In the post-Cold War era, however, peacekeeping operations tend to be dangerous and require a balance between maintaining combat readiness and exercising restraint. Recent peacekeeping missions share many of the same high-risk events associated with post-traumatic stress responses and other mental health problems found in the literature on combat. These missions are characterized by traditional war-zone demands (e.g., dangerous patrols) and stressors associated with dangerous humanitarian missions (e.g., witnessing violence and human degradation, and receiving hostile responses from the civilian population). Recent reports have shown links between exposure to peacekeeping-related events in Kosovo and an increase in physical symptoms, use of aggressive tactics, reduced sleep, increased number of days lost because of illness, and increased alcohol use.[4] In addition, Litz et al.[5] found that veterans of the peacekeeping mission in Somalia have significant and long-term stress reactions.

Soldiers deployed as peacekeepers can experience anxiety, frustration, and helplessness from their peacekeeper role and can be exposed to events that are potentially traumatizing (e.g., mass grave sites, injured civilians, and landmines). In a recent study of U.S. peacekeepers deployed to Kosovo, about one-half of the soldiers reported high levels of such events.[6] In addition, soldiers are exposed to the general stressors associated with any overseas deployment (e.g., daily hassles and family issues) that may compound the impact of peacekeeping stressors.[7,8]

Although the majority of soldiers may cope well with the demands of a peacekeeping deployment, exposure to peacekeeping stressors is also associated with post-traumatic stress reactions, depression, and problems with aggression. The potential psychological consequences that can result from participation in peacekeeping operations suggest the importance of health surveillance for military personnel who deploy in support of such missions.

Psychological Screening Programs

Psychological screening, one component of health surveillance, has been used extensively to predict job or illness-related outcomes and to determine risk indicators. One example of extensive psychological screening is found in law enforcement officer selection and assessment. Recent literature on screening for police officer on-the-job performance generally describes attempts to predict poor performance and dysfunctional job behaviors using various personality inventories. Typically, there is a subsequent follow-up that includes subjective and objective ratings of performance.[9-11] Representative studies generally assess small samples and find differences on selected subscales of the inventories for the success and failure criterion groups.

Examples of psychological screening from the community mental health screening literature may be found in Weissman et al.[12] who present a series of studies in psychosocial epidemiology and community surveys of psychiatric disorders. The studies included in the series are large-scale community assessments attempting to determine prevalence and incidence rates of psychiatric illnesses to recommend prevention and treatment program policies.

Both the personnel selection and community screening assessment literature have aspects in common with psychological screening and health surveillance in military populations. Common factors include the focus on risk assessment and determining the validity of the screening instruments for predicting criterion performance. Recent literature on health surveillance and operational deployments provides models of psychological screening that have been designed to assess the impact of such experiences on peacekeepers.

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This manuscript was received for review in July 2001 and accepted for publication in December 2001.

Health Surveillance and Military Deployments

Authors contributing to military medical journals on the topic of health surveillance emphasize its importance for deployed forces and the early involvement of medical staff for prevention and risk assessment. They recommend that health surveillance for military personnel be included in predeployment operational and medical planning and then monitored at mid-deployment and postdeployment.[1,3]

In addition to a consistent focus on prevention efforts, Dobson and Marshall[13] address operational deployments in terms of exposure to traumatic events. They discuss prevention strategies prior to deployment that include providing information and education about the occupational, interpersonal, and traumatic types of stressors that might occur and teaching stress management techniques. Postexposure behaviors are targeted using debriefing strategies to teach appropriate coping techniques and educate participants about normal and abnormal reactions to stress. Health surveillance during military deployments encompasses two primary types of surveillance: service-oriented surveillance and organizational trends. Typically, military programs emphasize one of these types more than the others. Service oriented is typified by psychological screening, and organizational trends are exemplified by survey-based research.

In a real-world example of service-oriented health surveillance of, Ritchie et al.[14] describe the deployment of the 528th Combat Stress Control Unit to Somalia in 1993 in support of Operation Restore Hope. Their efforts focused mainly on responding to unit requests, making rounds to ask about the mental health status of soldiers, and offering to conduct stress management classes and critical incident stress debriefings. There was no integrated psychological screening program; rather the Combat Stress Control Unit provided targeted outreach and acted as a referral resource for commanders. The majority of their early patients were described as young soldiers referred by their command because of difficulties coping with Somalia and the separation from home. Such a program does not address predeployment and postdeployment functioning.

In a more comprehensive form of health surveillance, Buma et al.[2] conducted a prospective study of approximately 2,300 Dutch marines deployed to Cambodia in 1992 and 1993. The focus of this work was on documenting physiological diagnoses using International Classification of Diseases codes, attempting to identify risk factors before and during the deployment, and assessing lost workdays as an outcome measure. The study illustrates an effective surveillance program where consultations, diagnoses, treatments, and lost work days were entered into a database, allowing the medical staff to track soldier status over the course of the deployment. These data could in turn be analyzed using demographic, unit-related, and other unique contextual factors of the deployment. A nondeployed battalion based in The Netherlands was also included in the study as a comparison sample. Unfortunately, data collection with the deployed soldiers stopped after departure from Cambodia so there was no follow-up information on outcomes for units or military personnel. However, longitudinal follow-up could be easily incorporated into the health surveillance design using this model.

Although not an attempt to identify and follow individual soldiers, Orsillo et al.[15] examined the types of stress and psychological reactions of approximately 3,500 U.S. military peacekeepers following their deployment to Somalia. The authors used a survey assessing experiences in Somalia and the 53-item Brief Symptom Inventory as a measure of psychological distress.[16] They found a substantial proportion of the sample reported postdeployment psychiatric distress with 40% of respondents endorsing enough symptoms on the general severity index of the Brief Symptom Inventory to meet criteria for "caseness." The authors cautioned that the designation of caseness was only suggestive of significant psychological problems and an indicator that the respondent required further assessment. However, they concluded that their results indicated the need for further study of the psychological distress experienced by peacekeepers.

Symptom dimensions endorsed by more than one-third of respondents included hostility, depression, paranoid ideation, and psychoticism (items on the latter scale were re-examined to reveal that elevations on the scale were related to interpersonal alienation and hostility rather than to classic psychotic symptoms). Results also indicated that separation from family and friends, difficulty communicating with home, and loss of privacy negatively affected one-half of the sample. The finding from postdeployment Somalia that exposure to war-zone traumatic stress was the strongest predictor of symptoms is also consistent with research conducted with soldiers deployed to Kosovo.[4] However, Orsillo et al.[15] noted several limitations to their study of soldiers deployed to Somalia, including the absence of information on respondents' predeployment functioning and the lack of formal diagnostic assessment to confirm self-reported symptoms.

Another relevant example of a military health surveillance program, this time involving psychological assessment, comes from the New Zealand Defense Force in a study conducted in 1992 when their military personnel deployed on various peacekeeping missions.[17] The study was longitudinal and cross-sectional and included 277 New Zealand Defense Force personnel. Self-report data were collected at five different time periods: predeployment, the early phase of deployment, mid-deployment, postdeployment, and follow-up 6 months after return. The surveys included an assessment of mental health using measures of positive well being, psychological distress, state anxiety, and depression. Ratings of severity for 54 physical health symptoms and a rating of overall health were also included. A deployment hassles scale developed for the study assessed possible deployment-related hassles.

The authors found that military personnel assessed at predeployment and those assessed at the 6-month follow-up reported higher levels of anxiety and psychological distress when compared with personnel assessed during the deployment. The mental health status of personnel at the 6-month follow-up was significantly worse on all mental health measures. The pattern for physical health symptoms indicated that ratings of physical symptoms were relatively constant across all phases of the deployment, except at the early deployment phase when ratings increased significantly. Stress ratings for deployment hassles were highest at predeployment, followed by significant decreases at the early and mid-deployment phases. Despite the limitations of the study's cross-sectional design, two phases of the deployment emerged as having the greatest negative effect on mental health indicators: predeployment anticipation and

preparation and the period following return when soldiers were reintegrating into family and job roles.

The New Zealand Defense Force study illustrated several important factors. First, it reinforced the importance of assessment at different phases of the deployment, ideally following the same soldiers over time. The second factor was the significant stress that soldiers experienced at the predeployment anticipation and preparation phase. Finally, the study indicated that the postdeployment reintegration phase may require a more extended period of time for some military personnel.

The final example of a health surveillance, deployment-related study from other military forces comes from the Australian Defense Force. Johnston[18] described the peacekeeping deployment of the Australian Defense Force to East Timor in 1999, accompanied for the first time by members of the Australian Army Psychology Corps. The Psychology Corps deployed with a plan that had been refined over the decade since Australian forces had participated in various United Nations' missions. Their three-phased approach emphasized predeployment training of forces, in-country support while deployed, and postdeployment debriefing and support. The latter two phases consisted of psychological assessments and a mental health screen to include the post-traumatic stress disorder (PTSD) checklist, the World Health Organization Alcohol Use Disorders Identification Test, and the12-item General Health Questionnaire. Every Australian Defense Force member attended a postdeployment debriefing, completed the mental health screen, and was interviewed by a psychologist who provided triage and referral service.

Findings on the PTSD checklist indicated 1.2% of the sample of 732 personnel who completed the mental health screen reported PTSD symptoms. Findings from the General Health Questionnaire indicated relatively high rates of "caseness" (18.4% for combined mild and severe caseness). However, these rates were not confirmed in follow-up mental health interviews where most referrals occurred for minor adjustment issues. There were no comparative baseline data for alcohol use rates, making it difficult to interpret the finding of high rates of alcohol use on the World Health Organization Alcohol Use Disorders Identification Test. Of interest was the finding that those with the most serious psychological problems following the deployment were those who had previously experienced a service-related or personal trauma.

Literature Summary

Dobson and Marshall[13] emphasize the importance of establishing clear criteria for evaluating the effectiveness of prevention programs across different operational contexts. The surveillance programs discussed above vary in their comprehensiveness, focus, and in the nature of the assessments. Overall, however, the findings show stressors associated with each phase of the deployment cycle, from predeployment until well after return. The research is also consistent in that long-term outcomes for military personnel assessed during deployment are unknown.

The following sections (a) describe the psychological screening program for U.S. military personnel in different operations, (b) present key findings from the psychological screening program, (c) highlight some of the lessons learned when implementing a psychological screening program, and (d) suggest areas for future research.

Force Health Protection Program

The Assistant Secretary of Defense for Health Affairs mandated the Joint Medical Surveillance Program for U.S. Forces in 1996. The objective was to ensure that peacekeepers deployed to the Bosnia area of operations received appropriate medical attention after they returned from the deployment. The European Command was responsible for oversight and overall execution of the program, one component of which was psychological screening. The European Command tasked the U.S. Army Medical Research Unit-Europe (USAMRU-E) to develop and implement the psychological screening program and to create and maintain a comprehensive database for the surveys.

Since the time that psychological screening began as part of the Joint Medical Surveillance Program, U.S. soldiers have been screened across the deployment cycle: in garrison, as they prepared to deploy, at redeployment just before return, and at postdeployment several months later. The screening has also expanded to include operational deployments to Albania and Kosovo. Comparisons of soldier well-being across the various deployment phases resulted from this expansion of the screening program. The sections below summarize the methodology of the screening and different stages of the program, beginning with the initial Bosnia screening program up to the present screening of units deployed to Kosovo.

Procedure

In 1996 all U.S. military personnel deployed to the Bosnia Area of Operation for more than 30 days were required to complete a mental health screen as they redeployed back to home station. Redeploying personnel were briefed about the purpose of the screening and administered the primary screening survey. Respondents who exceeded pre-established cut-off criteria completed a secondary screening survey and were then interviewed briefly by a mental health care provider to determine referral needs. The primary screening survey was administered in groups ranging up to 100 personnel depending on how many were redeploying at the time. Those personnel receiving a secondary screening survey were interviewed individually.

Core Measures

The first section of the survey instrument consisted of a series of demographic items, followed by questions on deployment history. Three clinical scales comprised the initial psychological screening instrument. These core measures included scales assessing PTSD disorder, depression, and alcohol use. The PTSD scale was based on the 1994 American Psychiatric Association: Diagnostic and Statistical Manual for Mental Disorders (fourth edition) criteria for clinical diagnosis of PTSD.[19] Soldiers were asked to respond to 17 items based on an extremely stressful event(s) that they had experienced during the deployment, such as a life-threatening event or witnessing something tragic or horrible.[8,20] Response choices were based on a five-point scale from "not at all" to "very often." Respondents exceeded criterion on this scale if they rated at least six items as "often" or "very often." The items are summarized in Table I.

The Self-Rating Depression Scale consisted of 20 items assessing depressive symptoms.[21] Response choices were based on a four-point scale from "none or a little of the time" = 1 to

TABLE I

ITEMS FROM THE USAMRU-E POST-TRAUMATIC STRESS DISORDER SCALE

1. Had upsetting memories of the stressful event(s)
2. Had upsetting dreams of the stressful event(s)
3. Suddenly felt like I was going through the stressful events(s) all over again
4. Felt upset because something reminded me of the stressful events(s)
5. Had a physical reaction (such as hands sweating, heart pounding, dizziness) when something reminded me of the stressful event(s)
6. Tried not to think or have feelings about the stressful event(s)
7. Tried to avoid activities or situations that reminded me of the stressful event(s)
8. Could not remember certain things about the stressful event(s)
9. Was not as interested in things that used to be important to me
10. Felt distant from other people
11. Did not feel things as intensely as I used to
12. Felt hopeless about the future
13. Had difficulty falling or staying asleep
14. Felt annoyed or angry
15. Had difficulty concentrating
16. Felt more alert and keyed up than usual
17. Got suddenly scared or startled

Note: Response choices are "not at all," "rarely," "sometimes," "often," and "very often."

"most or all of the time" = 4. Respondents exceeded criterion if their score was 44 or higher or if they endorsed the statement, "I feel others would be better off if I were dead." Previous studies comparing depressed and nondepressed patients indicate that scores below 40 are within the normal range, whereas scores between 41 and 47 indicate the presence of minimal to mild depression, scores between 48 and 55 indicate moderate to marked depression, and scores of 56 and over indicate severe to extreme depression.[22]

The potential for alcohol problems scale consisted of four items with either a "yes" or "no" response choice.[23] The items included: (a) "Have you ever attempted to cut back on alcohol?" (b) "Have you ever been annoyed by comments made about your drinking?" (c) "Have you ever felt guilty about drinking?" (d) "Have you ever had an eye-opener first thing in the morning to steady your nerves?" Respondents exceeded criterion if they answered "yes" to two or more of these questions.

The psychological screening core instrument contains scales and items that have been used since 1996 with the implementation of the Joint Medical Surveillance Program. The instruments were selected because they have face validity, are short and understandable for soldiers, and have been proven effective as screening instruments.[20,22,24,25]

Expansion of Screening Measures

Several sections have been added to the original Bosnia screen. The Hostility Scale of the Brief Symptom Inventory assesses anger and hostility found to be frequently reported symptoms by deployed soldiers.[16,26] Another added section contains the Quality of Marriage Index.[27] Recent psychological screen findings indicated that family stress is reported frequently by both married and single soldiers.[26] Clinical and personal history questions follow the symptom scales. These questions have been used in past screenings and have been found effective in identifying subclinical problems.[28] The questions are summarized in Table II.

Four additional sections assessing the following have also been added: (a) peacekeeping experiences, (b) trauma history, (c) physical health, and (d) lost work because of illness. These scales provide a context for the five clinical scales and permit the screening program to identify meaningful organizational trends. Whereas these scales are not used to determine the need for a clinical interview, they provide background information in the clinical assessment.

The 24-item list of peacekeeping experiences asks respondents to rate the impact of a number of events that could be experienced during a peacekeeping operation. An earlier version of the Peacekeeping Incidents and Experiences Scale was included in the Kosovo Soldier Study conducted by the USAMRU-E in 1999.[6] Findings indicated that the number of events soldiers were exposed to affected physical symptoms and post-traumatic stress rates, use of conflict-based tactics, sleep, and work days missed. A Life Events Checklist assessing trauma history has also been added to the screening instrument to provide a baseline measure of past trauma exposure (National Center for Post-Traumatic Stress Disorder, unpublished data, 2000). Trauma history has been shown in previous research to be predictive of higher symptom levels in military personnel exposed to subsequent stressors.[18,29#] The 24-item Physical Health Questionnaire has been included because of recent findings from psychological screenings indicating a relationship between physical and psychological symptoms and between physical symptoms and mental health referrals.[4] Lastly, two items were included that ask soldiers to report the frequency of clinic and/or sick call visits and lost work days during the last 30 days. All personnel who exceeded criteria on at least one of the primary screen scales were given a brief on-site psychological interview to determine the need for follow-up intervention. The clinician records the interview outcome and, if a referral is given, the reasons for referral are noted (for overview of process, see Fig. 1).

TABLE II

SECONDARY SCREENING SURVEY CLINICAL QUESTIONS

1. Have you received mental health or alcohol counseling in the past?
2. Are you currently receiving mental health or alcohol counseling?
3. Would you like to speak to a counselor?
4. Do you have relatives who have attempted or committed suicide?
5. Do you have relatives with alcohol problems?
6. Have you ever been on any medication for emotional problems or insomnia?
7. Are you having marital or relationship problems?
8. Are you having financial or legal problems?
9. Do you feel like hurting yourself now?
10. Did you feel like hurting yourself during this deployment?

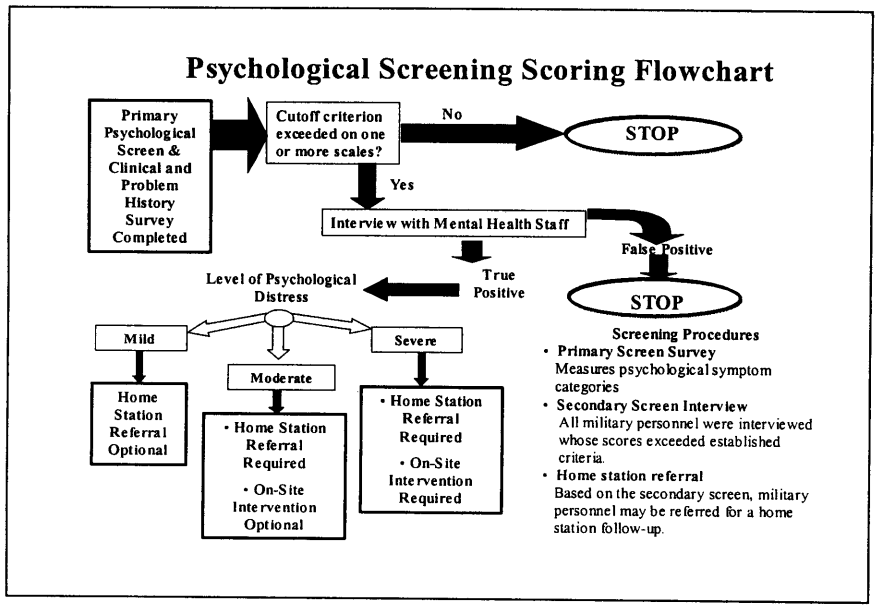

Fig. 1. Overview of Force Health Protection Screening.

Psychological Screening in Different Operations in the U.S. Army-Europe

Throughout the development of psychological screening with U.S. soldiers in Europe, the basic procedures for administering the primary screen and brief secondary interviews have remained constant. Table III provides an overview of the psychological screening in different operations. Table III includes the deployment phase, the mission and screening location, the approximate number of military personnel screened, and the dates of the screening.

Psychological Screening of Military Personnel Deployed to Bosnia

As of January 1999, 65,837 military personnel deployed to Bosnia completed the screening program. The secondary screening instrument assessing personal and family history of problems was developed in Bosnia by division mental health staff tasked to conduct the screening program. Later in the program, the secondary screen was standardized and integrated into the overall screening program. Research conducted on the screening program found that these refinements provided useful information and aided in the screening process.[20] The screening program in Bosnia also demonstrated the importance of obtaining information about deployment length and previous deployment history. These items were subsequently added to the psychological assessment.

Psychological Screening of Military Personnel in Garrison

To provide a basis for understanding the Bosnia data, 790 soldiers in garrison were screened at 10 U.S. installations in

TABLE III

OVERVIEW OF THE DEPLOYMENT PHASE, THE MISSION AND SCREENING LOCATION, THE APPROXIMATE NUMBER OF MILITARY PERSONNEL SCREENED, AND THE DATES OF THE SCREENING

Study Description	Mission	Screening Location	*N*	Dates
Redeployment	Operation Joint Endeavor (Bosnia)	Hungary	27,767	February 1996–December 1996
Redeployment	Operation Joint Guard (Bosnia)	Bosnia	29,333	January 1997–June 1998
Redeployment	Operation Joint Forge (Bosnia)	Bosnia	14,268	July 1998–October 1999
Garrison	Garrison (Germany)	Germany	790	April 1998–July 1998
Air Force Garrison	Garrison (Germany)	Germany	747	July 1999–August 1999
Postdeployment	Task Force Hawk (Albania)	Germany	1,043	August 1999–October 1999
Redeployment Rotation 1B	Task Force Falcon (Kosovo)	Kosovo	3,520	May 2000–June 2000
Postdeployment Rotation 1B	Task Force Falcon (Kosovo)	Germany	200	September 2000
Predeployment Rotation 2A	Task Force Falcon (Kosovo)	Germany	1,803	April 2000–June 2000
Redeployment Rotation 2A	Task Force Falcon (Kosovo)	Kosovo	3,641	November 2000
Postdeployment Rotation 2A	Task Force Falcon (Kosovo)	Germany	1,363	March 2001
Predeployment Rotation 2B	Task Force Falcon (Kosovo)	Germany	3,319	November 2000
Redeployment Rotation 2B	Task Force Falcon (Kosovo)	Kosovo	4,756	March 2001
Postdeployment Rotation 2B	Task Force Falcon (Kosovo)	Germany	1,327	August and November 2001

Germany from April to June 1998. The final report from USAMRU-E compared the garrison data to Bosnia data collected from 1996 to 1998.[30]

Soldiers in the garrison sample were also given a one-page survey on physical health symptoms to compare the physical symptom screening data with the data collected in the medical screening component of the Joint Medical Surveillance Program conducted in Bosnia. Results from this study provided garrison norms and demonstrated the relationship between psychological and physical health symptoms.[30]

Psychological Screening of Military Personnel Deployed to Albania

The psychological screening program continued with a command-directed postdeployment screen initiated by a division based in Germany. From August to October 1999, more than 1,000 soldiers from the division who had primarily deployed to Albania in support of Task Force Hawk completed psychological screening. The objectives were to assess identify soldiers in need of follow-up, to assess deployment-related mental health concerns, and to compare findings for these soldiers with results from subsamples of soldiers from the same division assessed in garrison and in Bosnia.

Psychological Screening of U.S. Peacekeepers Deployed to Kosovo

Command-based interest in the psychological screening program continued, although the Joint Medical Surveillance Program for military personnel redeploying from Bosnia was officially discontinued in 1999. The USAMRU-E implemented a new redeployment screening program in April 2000 at the request of another Germany-based division as their soldiers prepared to redeploy from Kosovo. At approximately the same time that this division was being screened for redeployment from Kosovo, support was requested for predeployment screening as the follow-on force prepared to deploy. These new efforts were conducted in April through June 2000 and became integrated into the Department of Army's Force Health Protection/Gulf War Illnesses Research Program.

The redeployment screening in Kosovo included 3,520 soldiers. A one-page screening instrument was developed that focused on acute stress disorder symptoms and on reactions to traumatic exposure during the deployment. Two family separation stress items were introduced and, consistent with past screening surveys, items addressing thoughts of harming self or others.

To date, psychological screening has been conducted at predeployment, redeployment, and postdeployment. These screening efforts comprise a larger program that now falls under the Department of Army's Force Health Protection/Gulf War Illness Research program. Having reviewed the screening programs conducted by the USAMRU-E since the Joint Medical Surveillance Program began in 1996 with the Bosnia redeployment screening, an overview of findings from studies assessing the stress of peacekeeping operations and the possible psychological consequences of such experiences is provided below.

Summary of USAMRU-E Key Findings

Psychological screening has been conducted by the USAMRU-E from 1996 until the present time. The screening program has included a variety of samples screened by different teams using similar measures and procedures. Overall, findings indicated significant differences across samples in primary screen and referral rates with primary screen rates ranging from 16.0% to 25.6% and referral rates ranging from 2.4% to 11.3%.

The following sections summarize key findings from the psychological screening program. Included are findings from screening programs conducted from February 1996, with the initiation of the Joint Medical Surveillance Program for redeploying military personnel from Operation Joint Endeavor, Bosnia, until the predeployment screening of soldiers deploying to Kosovo conducted in June 2000.

Demographics

Rank

Across the various screening programs, noncommissioned officers and officers were less likely to exceed criteria on any of the scales or to receive a referral than junior-enlisted personnel (Fig. 2).[28,31-34]

Status

For the Bosnia sample, active duty soldiers had the highest rates of exceeding criteria on the primary screen compared with National Guard and Reserve soldiers; however, active duty and Reserve soldiers had higher referral rates than National Guard soldiers.[31,33,35]

Component

During the Bosnia deployment, Army soldiers were more likely to exceed criteria on the primary screen than Air Force and Navy military personnel.[32,33,35]

Gender

There were no overall gender differences in exceeding criteria on the primary screen, although gender differences were evident in specific settings or situations.[36] For example, female soldiers in garrison had significantly higher rates of exceeding criteria on the primary screen than male soldiers. This was not the case in the deployed environment. Studies that examined soldiers in both the garrison and deployed environments found that female soldiers exceeded criteria on the PTSD and depression scales at higher rates than male soldiers, although the latter had significantly higher rates on the alcohol screen.[31-33,37] Referral rates

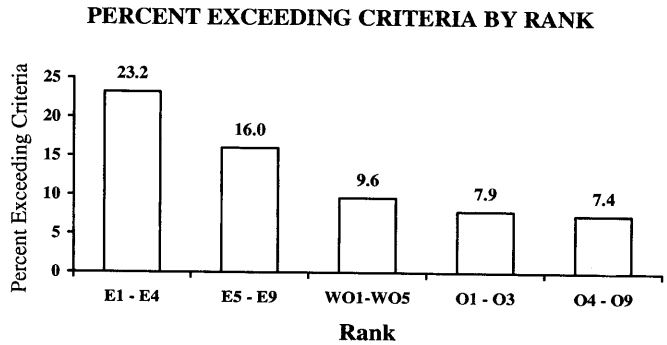

Fig. 2. For the Bosnia samples, the noncommissioned officers, warrant officers, and officers were less likely to exceed criteria on any of the scales or receive a referral than junior-enlisted personnel.

for male and female soldiers in the garrison sample were similar. However, female soldiers in the Bosnia sample had higher referral rates than male soldiers.[36]

Physical and Psychological Screening Link

For the Bosnia sample, military personnel exceeding criteria on the primary screen are at almost double the risk of reporting physical problems.[31,33,37] Correspondingly, for the garrison sample, the more physical health problems reported, the more likely the soldiers were to exceed criteria on the primary screen, and the more likely they were to be referred.[30]

Clinical History

Findings from psychological screening have also determined the importance of clinical and personal history questions for identifying a subclinical group of soldiers who would benefit from education and information, possibly preventing further referral requirements.

Martinez et al.[38] found that more than one-half of those soldiers deployed to Albania who exceeded primary screen criteria and were interviewed by mental health staff reported a family history of alcohol problems, and approximately 25% of the group who were interviewed reported marital, financial, or legal problems and a family history of attempted or completed suicides.

In addition, analysis of the predeployment screening rates for soldiers preparing to deploy to Kosovo revealed a subclinical group of soldiers who exceeded criteria but did not require a referral. This group differed from soldiers who did not exceed primary screen criteria in their endorsement of clinical and problem history items.[28]

Garrison vs. Deployed Environment

The garrison sample exceeded criteria on at least one of the psychological screening scales compared with the Bosnia sample.[30,39] Additionally, the garrison sample had a higher rate of referral than the Bosnia sample. These differences were significant and primarily found among junior-enlisted soldiers, not among noncommissioned officers or officers.

Deployment History

There was a weak relationship between deployment history (i.e., whether a soldier had previous deployment experience) and exceeding criteria on the psychological screen. Male soldiers who had deployed before were less likely to exceed criteria than those who had not deployed before. This was not true for female soldiers. Other results showed a positive, but not significant, trend in the relationship between deployment history and psychological well being. Although soldiers in garrison were more likely to exceed criteria on the primary screen compared with soldiers deployed to Bosnia, this difference disappeared when soldiers had deployment experience.[30]

Deployment Length

The impact of deployment length on psychological screening results has been examined in multiple operations.[28,31,33,34,37] Results have consistently shown that for male soldiers there is a significant relationship between deployment length and exceeding criteria on the primary screen. As shown in Figure 3, after 3 to 4 months the screening rates of male soldiers increased. This pattern did not hold true for female soldiers. Early in the deployment, male soldiers had lower primary screen and referral rates than female soldiers, but late in the deployment there were no gender differences.

Deployment Cycle

The screening results from one division collected during different missions over a 5-year period indicate two factors that may contribute to the identification of immediate and long-term health risks from deployment.[28,36] The first factor concerns the deployment cycle. Figure 4 summarizes data from several different psychological screening programs conducted across different phases of the deployment cycle indicating a pattern of psychological effects. Rates of exceeding primary screen criteria depended on when the screening occurred during the deployment cycle. Specifically, soldiers in garrison and preparing for deployment reported higher rates of distress than soldiers returning from deployment.[28] Results also suggest some unique deployment cycle patterns for specific symptom categories. For example, alcohol problem rates were highest at pre- and postdeployment, suggesting an "alcohol compensation" effect for soldiers preparing for or returning from an alcohol-free environment.

Although the screening occurred in one division, it should be noted that the sample groups were not matched and the data were collected at different times. Some of the differences in screening results could be attributed to the unique nature of each deployment, the maturity of the theater, or the level of threat. Nevertheless, the data suggest future directions for analyzing patterns of findings related to the deployment cycle. A series of psychological screenings with the same soldiers at pre-, re-, and postdeployment to Kosovo is planned.

Discussion

The psychological screening program, developed to meet the needs of U.S. soldiers stationed in Europe, now can be conceptualized as a comprehensive program that assesses soldier health across the deployment cycle. As illustrated in Figure 4, the screening program proposes to identify predeployment psychological issues, redeployment acute stress reactions, and postdeployment psychological adjustment. Use of this model can help clarify the effects of deployment on health during the different phases of the deployment cycle and can aid in the design of effective strategies for prevention, diagnosis, and treat-

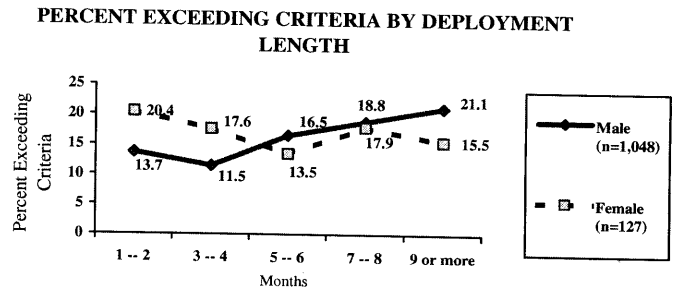

Fig. 3. Male soldiers' distress rates increased as the time on deployment increased. This pattern did not hold true for female soldiers.

DEPLOYMENT CYCLE PHASES

Garrison	Pre-deployment	Deployment	Re-deployment	Post-deployment	Garrison
Elevated rates on all scales but alcohol Highest on traumatic stress	Elevated rates on all scales Highest on depression	No Data Available	Lower rates on all scales	Elevated rates on all scales Highest on alcohol problems	Elevated rates on all scales but alcohol Highest on traumatic stress

Fig. 4. Data from several different psychological screening programs conducted across different phases of the deployment cycle indicate a pattern of psychological effects.

ment. The consequences of improvements in deployment and postdeployment surveillance can result in a system for early detection of changes in soldiers' mental functioning and in the design of preventive interventions for those at risk. The psychological screening program, organized by deployment cycle phases, can also provide commanders an assessment of the psychological readiness of their units.

The findings from the psychological screening program confirm that mental health monitoring is important for maintaining the medical readiness of military personnel deployed on peacekeeping operations. In the summarized studies, the data indicate that the mental health status of military personnel deployed to the Bosnia area of operations began to change after 3 to 4 months. This pattern has also been found for other deployments, indicating that for peacekeeping missions, mental health monitoring should be conducted when the deployment lasts 3 months or longer.

In addition to demonstrating the need for psychological screening for military personnel deployed on peacekeeping operations, the successful implementation of the program demonstrated that large-scale screening is feasible. This is not to say there were no obstacles for successfully implementing the screening program. For example, although instructions for the administration of the primary screening instrument were developed before the psychological screening program began, there was no secondary screen examining clinical history. This latter instrument was developed in the Bosnia area of operations by the mental health care providers tasked to execute the psychological screening program to facilitate the interview process. The revised secondary screening instrument was then standardized and integrated into the overall psychological screening program.

Another implementation issue was that the on-site mental health personnel responsible for the screening received no prior training, either formal or informal, in how to conduct the brief psychological assessments. Although a few personnel had received training in clinical survey administration, none of them were specifically trained to conduct brief "psychological triage." The mental health care providers were required to make very rapid decisions about the overall mental health status of military personnel who exceeded criteria on one of the primary screening scales. Basically, these mental health care personnel were conducting a form of psychological triage, a task that mental health care providers are rarely, if ever, asked to perform. Given the importance of psychological triage in mental health screening programs, this topic should be incorporated into existing training programs for military mental health personnel.

An additional implementation issue related to training in psychological triage concerns the reliability of referral rates. From on-site observation some mental health interviewers set high thresholds for referrals, whereas other screening staff had lower screening thresholds. These approaches varied depending on the team leader or officer assigned to conduct the screening and leave the referral rates difficult to interpret across screening programs.

Conclusion

The rate of military operations is increasing. Currently, military forces are required to support a variety of missions, including combat, peacekeeping, and humanitarian operations. Often, military units are required to support more than one operation at a time or deploy multiple times within a relatively brief period. In such an environment, it becomes critical to provide division surgeons and operational commanders information on the mental health of the deploying force. Ideally, predeployment screening identifies soldiers in need of mental health follow-up and establishes a reference database for comparison to future operations. Assessment at redeployment provides proactive mental health outreach and projects patient load at home station for redeploying service members. Postdeployment screening assesses the psychological readiness of soldiers for future deployment and identifies mental health issues for interventions with follow-on units. The three screening phases across the deployment cycle provide a system for continuous monitoring of the mental health of the force.

Results from the psychological screening program demonstrate that it is possible to implement a large-scale screening program that can effectively identify soldiers requiring referral. Psychological screening has assessed large samples of soldiers at different phases of the deployment cycle, providing a snapshot in time of soldier well being. However, there is little information concerning eventual outcome: how a soldier fares over time from predeployment until after return. Ideally, soldiers should be assessed longitudinally, prospectively assessing their psychological status prior to deployment and tracking their recovery upon return from deployment. A longitudinal study of soldiers throughout the different phases of the deployment cycle has the advantage of validating the effectiveness of the screening instruments in identifying those soldiers requiring referral. In addition, longitudinal follow-up will determine whether soldiers identified for referral actually seek treatment.

Overall, the psychological health, and thus the readiness, of military personnel can be directly measured and quantified, thereby providing a useful framework for the development of psychological and psychosocial measures. Future research should incorporate results from physical health screening as well. In this way, health surveillance for military deployments will incorporate the two primary types of surveillance: service-oriented psychological screening and the identification of organizational trends. Only by providing commanders with a complete assessment of the health of their force will they be able to ensure that all of the medical readiness needs of their personnel are addressed.

Acknowledgments

We thank the military personnel who participated in the psychological screening program for their time and effort, and the numerous mental health personnel involved in the screening program. We appreciate the contributions of the following individuals to the development and implementation of the psychological screening program: LTC Paul Bartone, Dr. Thomas Britt, CPT Robert Bienvenu, SGT Millie Calhoun, LTC Bruce Crow, SSG David Schlafer, and the Division Surgeons of the 1ID and 1AD. We thank Ms. Rachel Prayner for her support in the preparation of this manuscript.

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